

Oxygen Module

Optimize Oxygen, Natural Gas and Carbon Injection Efficiency

SmartFurnace®

The SmartFurnace® System enhances productivity and reduces energy use per ton of steel. As an advanced AI-driven expert system, based on the SmartKnB® platform developed by AMI, it dynamically adjusts electrical and chemical energy inputs based on real-time heat conditions. Recognizing that every EAF is unique, we provide the tools and expertise needed to optimize performance. With a modular design, the system enables coordination between energy input controls, while its open architecture allows for seamless customization, ensuring maximum efficiency.

Oxygen Module

Uses real-time electrical data from DigitARC® PX3 and SmartARC® to dynamically regulate gas, oxygen, and carbon injection based on heat conditions and bath composition, ensuring accurate endpoint prediction and optimal combustion control.

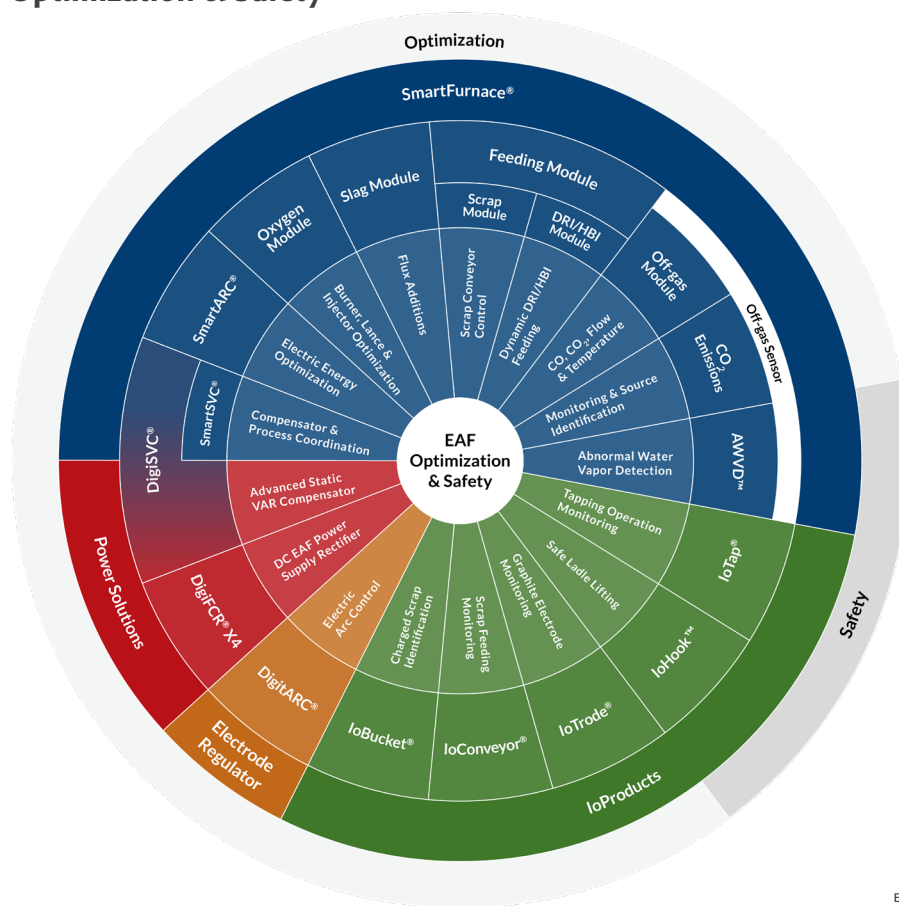
Key Features

- ▶ Burner/lance control add-on for flexible injector management.
- ▶ Decarburization and endpoint carbon control to reach target carbon levels efficiently.
- ▶ Carbon injection management with precise flow control.
- ▶ Compatible with any burners or injectors.
- ▶ Operator-friendly, making it easier to train new EAF operators.
- ▶ Real-time C and O₂ flow control, estimating bath oxidation using injected oxygen and calculated furnace oxygen demand.
- ▶ Statistical calculations to determine optimal oxygen lancing start/stop timing.
- ▶ Minimizes end-of-heat delays for temperature and ppm% correction and reduces FeO in slag.
- ▶ Combines with Slag Module for advanced chemical energy control.
- ▶ Can integrate with Off-gas Module for further optimization of carbon and oxygen usage.

Benefits

- ▶ Improves O₂ PPM control for consistent endpoint achievement.
- ▶ Increases iron and alloy yield by reducing oxidation losses.
- ▶ Optimizes carbon consumption for cost and process efficiency.
- ▶ Enhances FeO control in slag for better yield and lower slag losses.
- ▶ Reduces refractory wear with controlled oxidation conditions.
- ▶ Increases chemical energy input when scrap conditions allow, reducing electrical energy demand.
- ▶ Shortens carburization and oxidation times at tap, reducing power-on time and heat cycle duration.
- ▶ Supports safer and more consistent EAF operations, even with less experienced operators.

Electric Arc Furnace Optimization & Safety



EAF OPTIMIZATION & SAFETY DIAGRAM

Electrode Regulation System

The DigitARC® PX3 Electrode Regulation System is the core of AMI's EAF optimization solutions. With over 35 years of expertise and implementation in 275+ Furnaces worldwide, it delivers proven reliability and efficiency for even the most demanding EAF and LF applications. Our advanced electrode control technology ensures optimal arc stability, real-time performance monitoring, and seamless operator interaction through an intuitive interface. Today, more than 80% of the North American EAF steel capacity is melted with the AMI regulation systems.

IoProducts

Advanced solutions for monitoring and controlling critical aspects of the steelmaking process. Built on the SmartKnB® graphic development platform, they provide advanced customization within an open, user-friendly architecture. By integrating Artificial Intelligence, and Image Processing, these modules accelerate digitalization, improving efficiency, safety, and overall process optimization.

Power Solutions

We provide power electronic solutions that play a key role in enhancing Meltshop performance. The DigiFCR® X4 is our Firing Circuit Replacement system, designed to fully upgrade the controls of existing DC EAF power rectifiers. It improves current regulation while also extending protection for the furnace. Meanwhile, the DigiSVC® is our advanced Static VAR Compensator that stabilizes voltage, improves power factor, and compensates for reactive power in industrial electrical systems. Both solutions can be delivered with new power electronic hardware or as retrofits for existing systems, regardless of the original manufacturer.

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